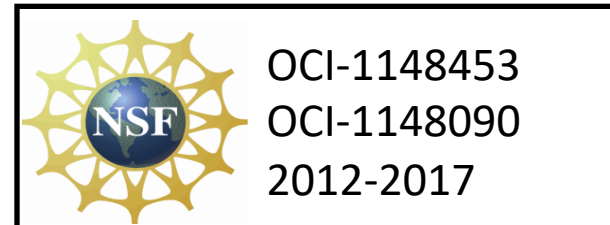


HydroShare

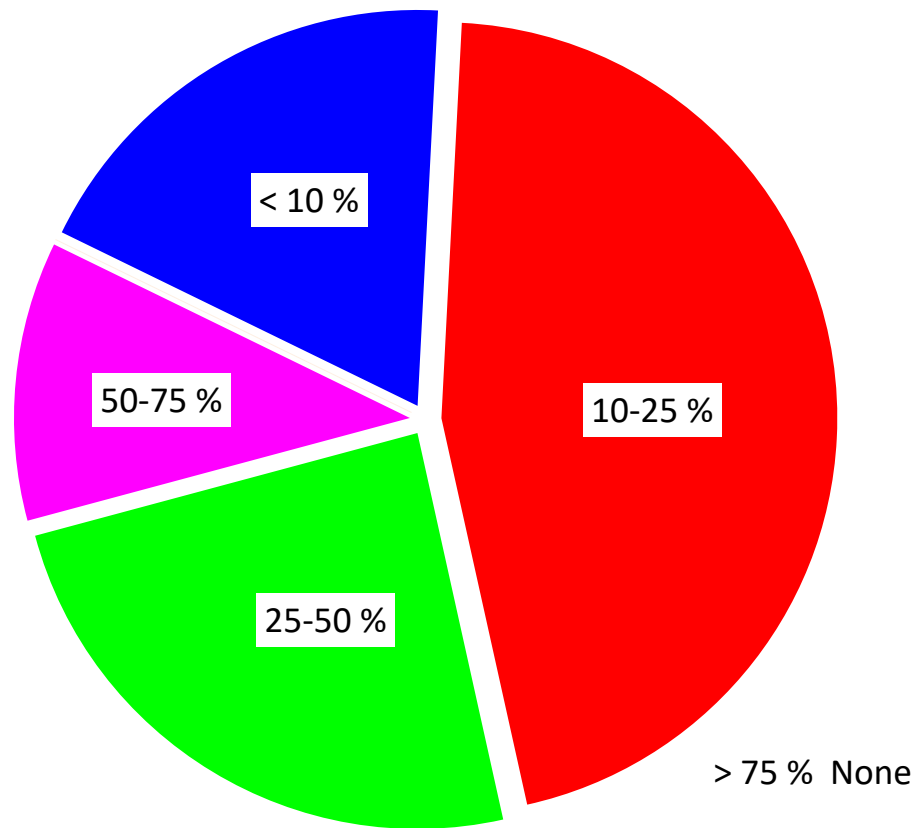
An online, collaborative environment for the sharing of hydrologic data and models

David Tarboton, Ray Idaszak, Dan Ames, Jeff
Horsburgh, Jon Goodall, Larry Band, Venkatesh
Merwade, Carol Song, Alva Couch, David Valentine,
Rick Hooper, Jennifer Arrigo, David Maidment, Tim
Whiteaker

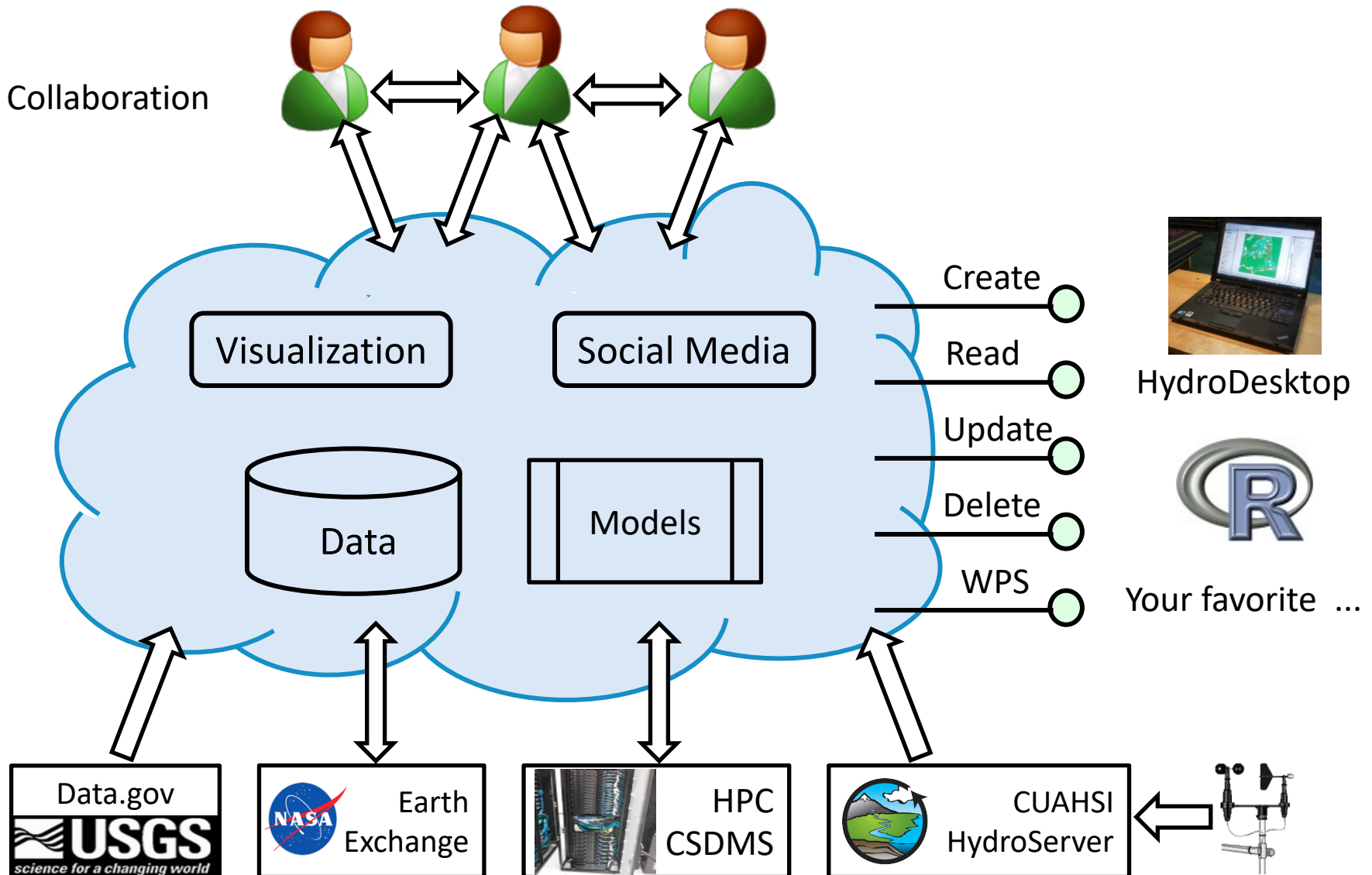
dtarb@usu.edu
<http://his.cuahsi.org>



What proportion of your research time do you spend on preparing or preprocessing data into appropriate forms needed for research purposes?



HydroShare



Can sharing data and models be as easy as sharing photos on Facebook or videos on YouTube?

The image is a composite of two web browser windows. The background window is a Facebook profile for David Tarboton. The foreground window is a YouTube video player showing a presentation titled "Hydrological investigation on the Carpathian Basin using HydroDesktop".

Facebook Profile (Background):

- URL: <http://www.facebook.com/#!/dtarb>
- Profile Picture: A photo of David Tarboton.
- Name: David Tarboton
- About Section:
 - Worked at Utah State University
 - Studied Hydrology at Massachusetts Institute of Technol
 - Lives in Logan, Utah
 - Married to Debbie Tarboton
- Navigation: Status, Photo, Place, Life Event
- Status: "What's on your mind?"
- Recent Activity: "Saint George Utah July 2012 (11 photos)"

YouTube Video Player (Foreground):

- URL: http://www.youtube.com/watch?v=RI8y_VIZgIE&feature=g-
- Title: Hydrological investigation on the Carpathian Basin using HydroDesktop
- Channel: MapWindowNL (43 videos)
- Video Content: A presentation slide titled "Hydrological investigation on the Carpathian Basin" by Boglárka BALÁZS, PhD student at the University of Debrecen. The slide also mentions "20-28. okt. 2012 Velp, Netherl".
- Player Controls: Play button, progress bar (00:03 / 14:54), volume, settings, and full screen.
- Engagement: 18 views, Like, Add to, Share buttons.
- Published on: Jul 4, 2012 by MapWindowNL

Right Sidebar (YouTube):

- Advertisement: Samsung GALAXY SIII
- More from subscriptions:
 - Walking On Air by ReelNASA (780,871 views)
 - Augmented Reality Sandbox with Real- by okreylos (1,486,927 views)
 - American Crossroads: by AmericanCrossroads (38,309 views)
- Suggestions:
 - Collaborative Prototyping by WebsiteWireframer (7,501 views)
 - OpenStreetMap: Putting people in

Can finding data and models be as easy as shopping on Amazon?

amazon Prime

Shop by Department

Gateway Gift Certificates/Cards

Department Books

- Engineering
- Mathematics
- Schools & Teaching
- Education Theory
- Electrical Home Improvement

Music

- Alternative Rock
- Adult Alternative Pop
- Electronica

Kindle Store

- Computers & Internet

MP3 Downloads

- Electronica

Apps for Android

- Utility Apps

Cell Phones & Accessories

- Data Cables
- Accessory Kits
- Travel Chargers
- Accessories

Computers & Accessories

- USB Cables

Electronics

- MP3 Player Chargers

+ See All 36 Departments

Amazon Prime

Prime Eligible

External Hard Drives

Hard Drive Type

- Desktop (240)
- Portable (672)
- Mini (21)

David's Amazon.com Today's Deals Gift Cards

Search Books data

Go

Hello, David Your Account Cart Help

Possible Filters

Related Searches: data star trek, data.

Showing 1 - 16 of 2,847,698 Results

Data, Models, and Decisions: The Fundamentals of Management Science

David A. Foray

Data, Model

\$95.00 new (3)

\$80.68 used (1)

Available Formats

Format	Amazon Price	New from	Used from
Hardcover	—	\$95.00	\$80.68
Paperback	—	—	—
Unknown Binding	—	—	\$95.00

TEXTBOOKS

Amazon.com Textbooks Store

Search Amazon.com Textbooks Store and save up to 70% on textbook rentals, 30% on used textbooks and 60% on eTextbooks.

Price history | Track this product | Settings | Daily Drops | Manage Price Watches

Marketplace View

Marketplace Used

Close-up view On

All 11 days

Recommendations

Prices (perhaps usage)

Data, Data, Data, Data, Data Everywhere

LOOK INSIDE!

Data, Data, Data, Data, Data Everywhere

LOOK INSIDE!

6Ft USB Sync Cable

\$6.99 **\$1.37**

In Stock

More Buying Choices

\$0.01 new (36)

\$0.01 used (2)

Data, Voice

LOOK INSIDE!

Data, Voice, and Video Cables

LOOK INSIDE!

Customers Viewing This Page May Also View

- Convergent Database

Customers Who Bought This Item Also Bought

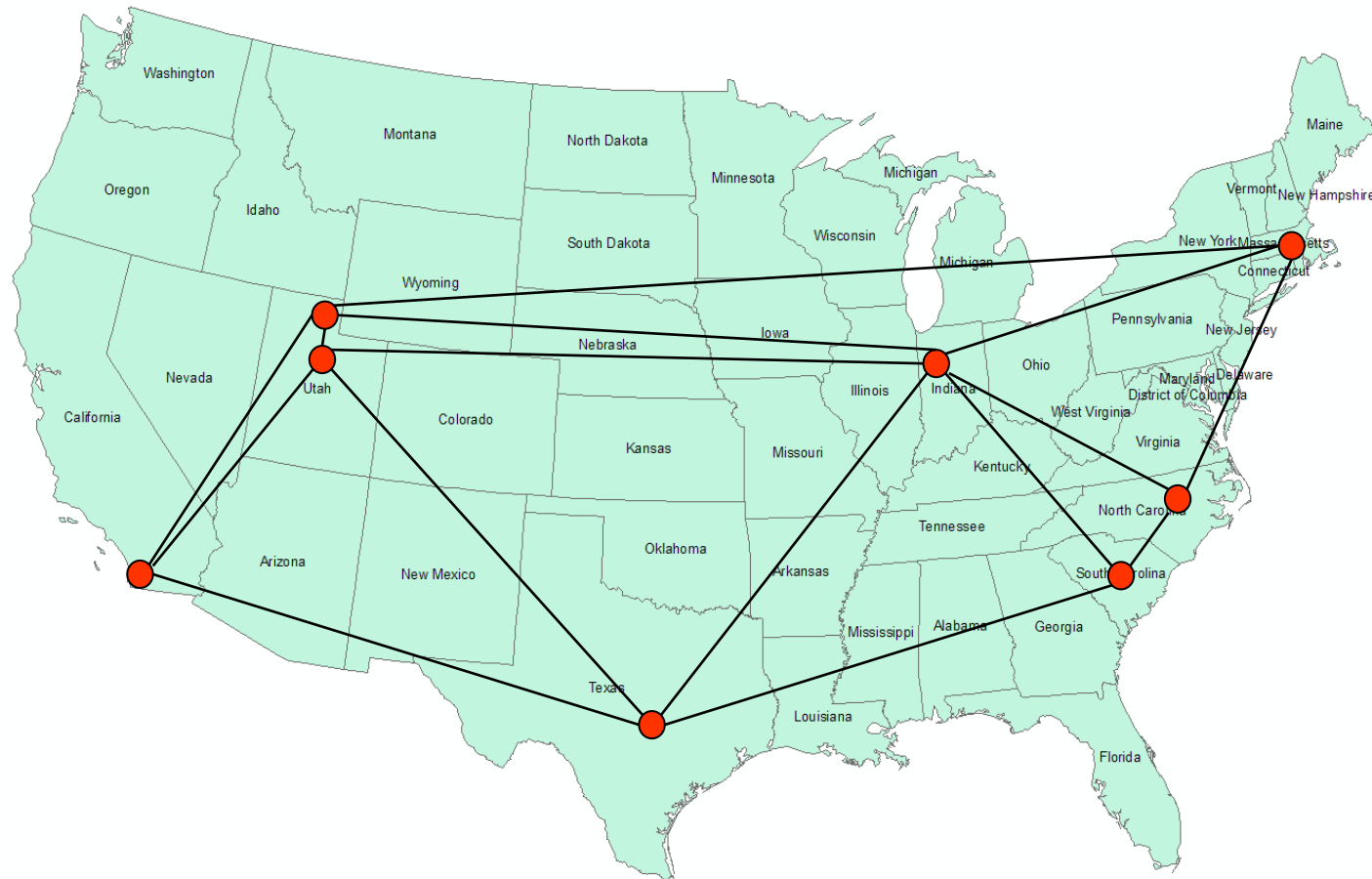
- Microcomputer (5th Edition) (The Pearson Series in Economics) Robert Pindyck Hardcover \$172.66
- Guide to Managerial Communication (5th Edition) Mary M. Munter Hardcover \$64.59
- Financial Accounting [3rd (4th Edition)] Thomas Dyceman Hardcover \$149.99
- Principles of Corporate Finance + S&P Market... Richard R. Easton Hardcover \$172.66
- Framework for Marketing Management (5th Edition) Philip Kotler Hardcover \$119.22
- Managerial Economics & Organizational... James Brickley Hardcover \$156.23
- The Business Writer's Companion Charles T. Brunson Hardcover \$31.08
- Business Dynamics: Systems Thinking and Modeling for... John Sterman Hardcover \$167.16
- The Truth About the New Rules of the Game... Nicole Cantor Hardcover \$13.76
- Matching Supply with Demand: An Introduction... Gerard Cachon Hardcover \$176.86

Editorial Reviews

Page 1 of 1

HydroShare project team

- USU
- RENC/UNC
- CUAHSI
- ISU (BYU)
- Tufts
- USC
- Texas
- Purdue
- SDSC



CUAHSI
HIS

Sharing hydrologic data



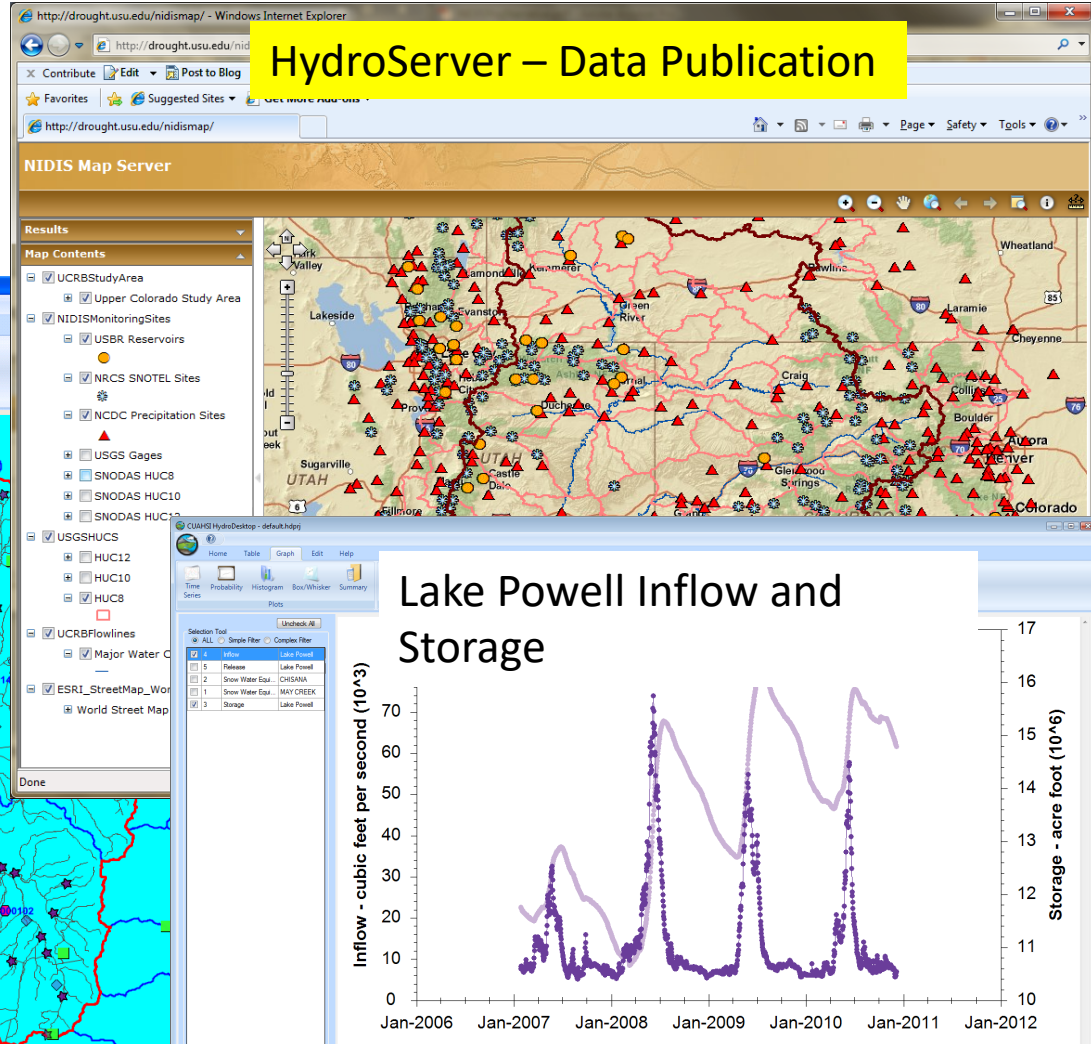
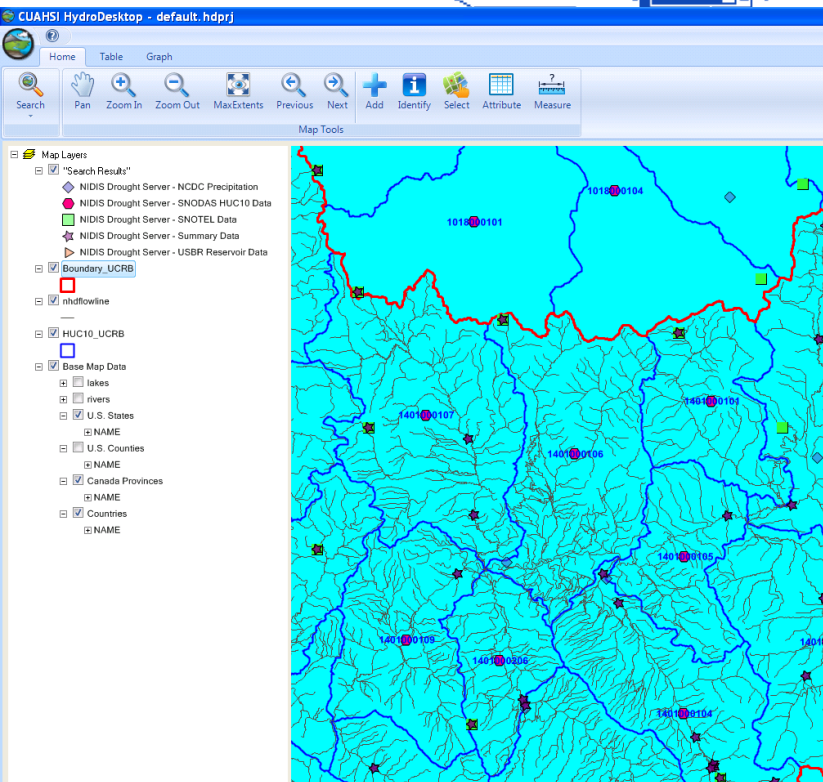
OCI-1148453
OCI-1148090
2012-2017

CUAHSI Hydrologic Information System

The CUAHSI Hydrologic Information System (HIS) is an internet based system to support the sharing of hydrologic data. It is comprised of hydrologic databases and servers connected through web services as well as software for data publication, discovery and access.



HydroCatalog
Data Discovery

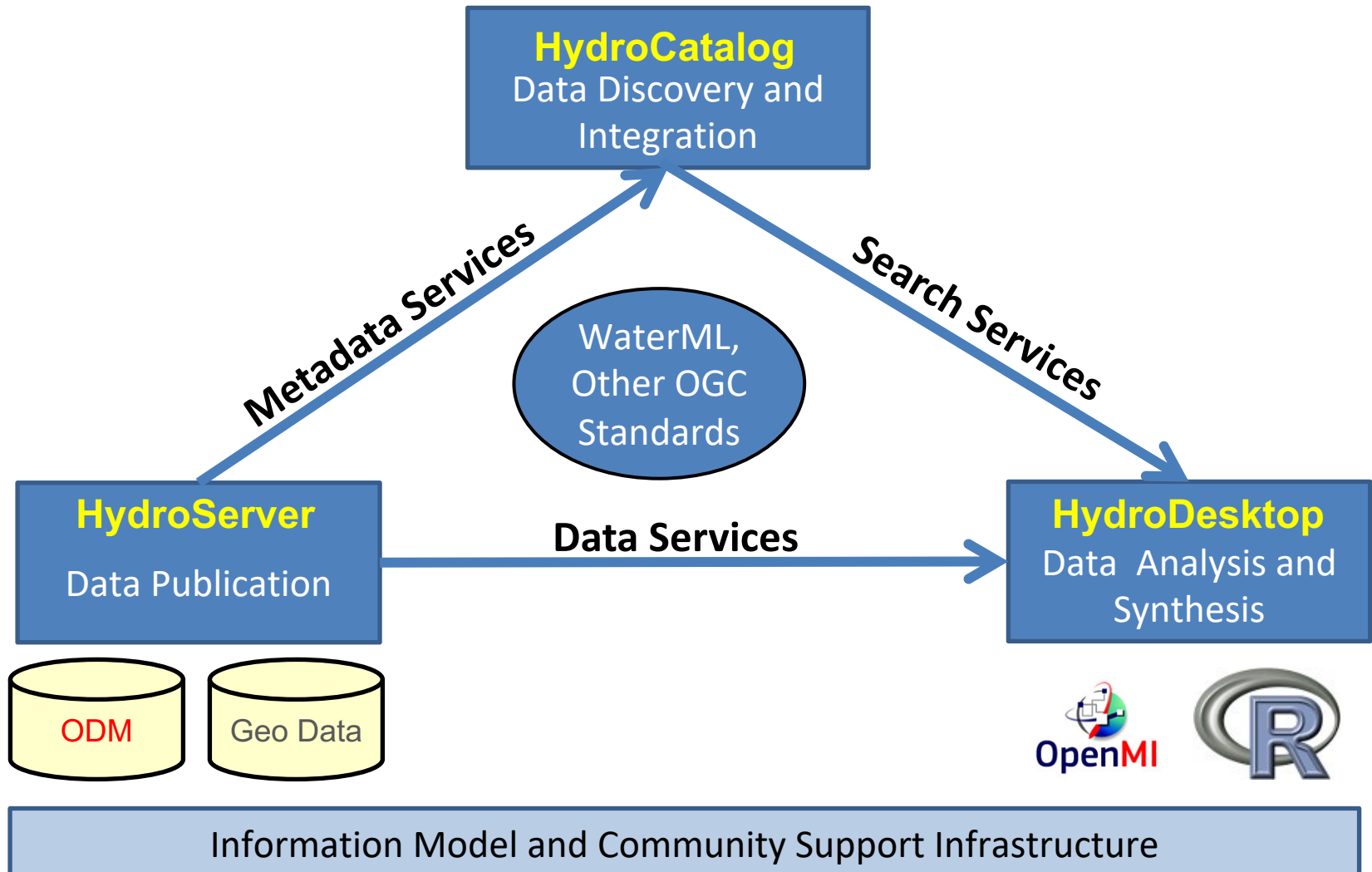


HydroDesktop – Data Access and Analysis

HydroDesktop – Combining multiple data sources

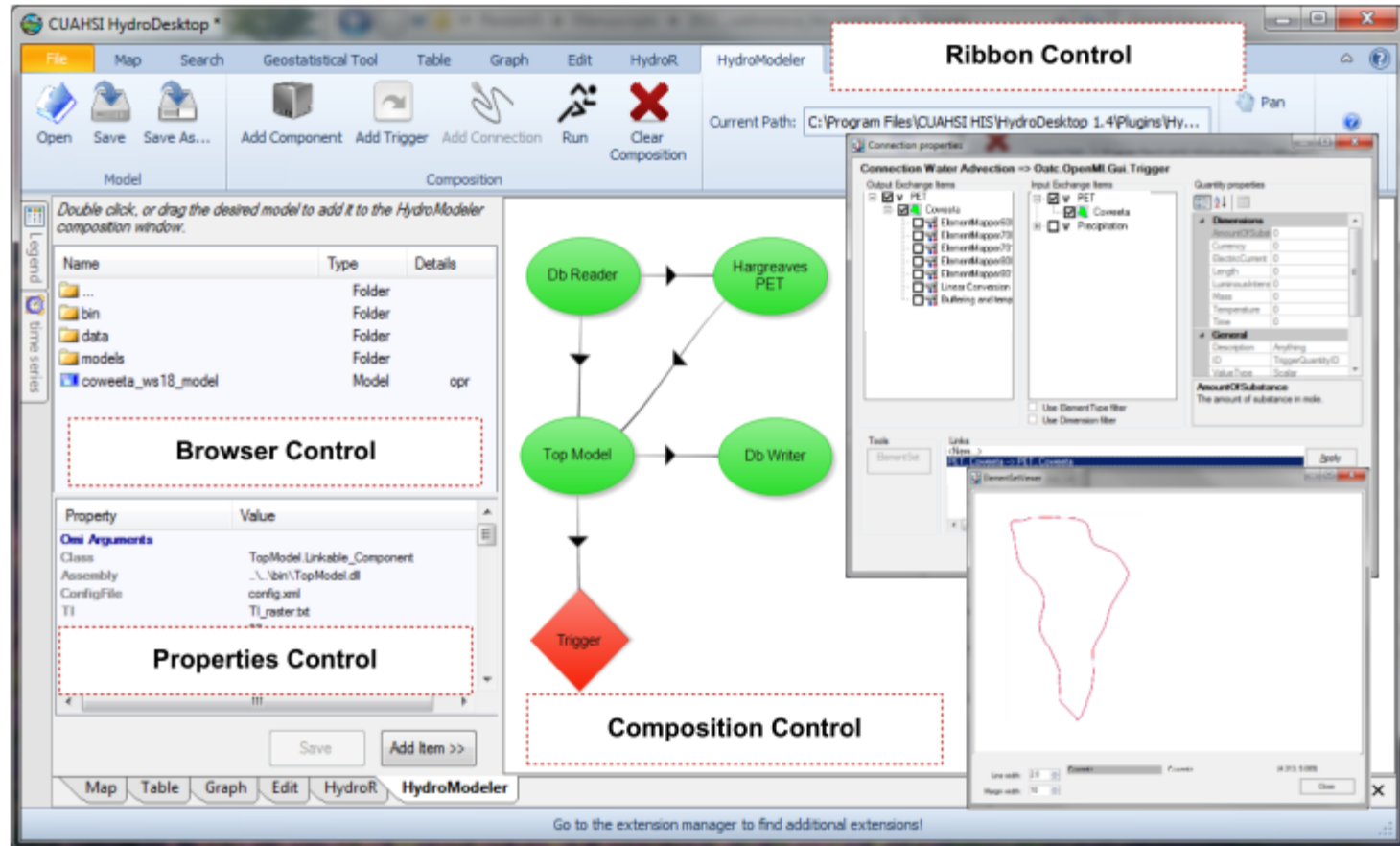
CUAHSI HIS

Services-Oriented Architecture



HydroDesktop and Modeling

An integrated modeling environment based on the Open Modeling Interface (OpenMI) standard and embedded within HydroDesktop



Integrated modeling within a Hydrologic Information System: An OpenMI based approach, Castronova, A.M., Goodall, J.L., Ercan, M.B. Environmental Modelling & Software, In Press. 10.1016/j.envsoft.2012.02.011.

CUAHSI HIS Key Aspects

- **Storage** in a community data model
- **Publication** from a server (92 registered to date)
- Data **access** through internet-based services using consistent language and format
- Tools for **access and analysis**
- **Discovery** through thematic and geographic search functionality
- **Integrated modeling and analysis** combining information from multiple sources
- **WaterML** evolved into Open Geospatial Consortium Standard, being considered by WMO and used by USGS and EPA among others

Open Development Model



The screenshot shows the HydroDesktop project page on the CodePlex Open Source Community. The browser address bar displays <http://hydrodesktop.codeplex.com/>. The page features a navigation menu with links to Home, Downloads, Documentation, Discussions, Issue Tracker, Source Code, People, and License. A search bar is available for CodePlex projects. The main content area includes a 'Download' button and a table of project details:

Property	Value
CURRENT	1.1.390
DATE	Wed Jan 26 2011 at 7:00 AM
STATUS	Stable
RATING	No Ratings
MORE	530 downloads View all downloads

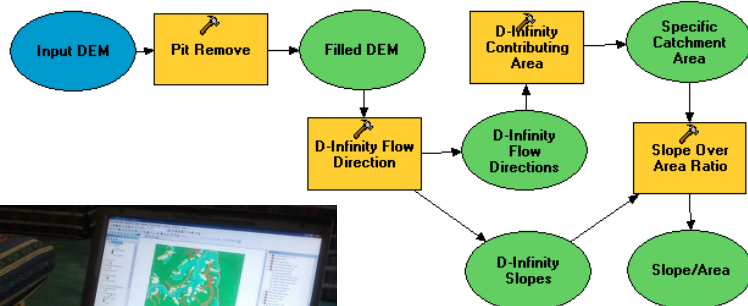
Below the table, there is an 'Activity' section showing page views, visits, and downloads. At the bottom of the page, there is a banner for 'DOT SPATIAL' and 'MAP WINDOW'.

- <http://his.cuahsi.org>
- <http://hydrodesktop.codeplex.com>
- <http://hydroserver.codeplex.com>
- <http://hydrocatalog.codeplex.com>

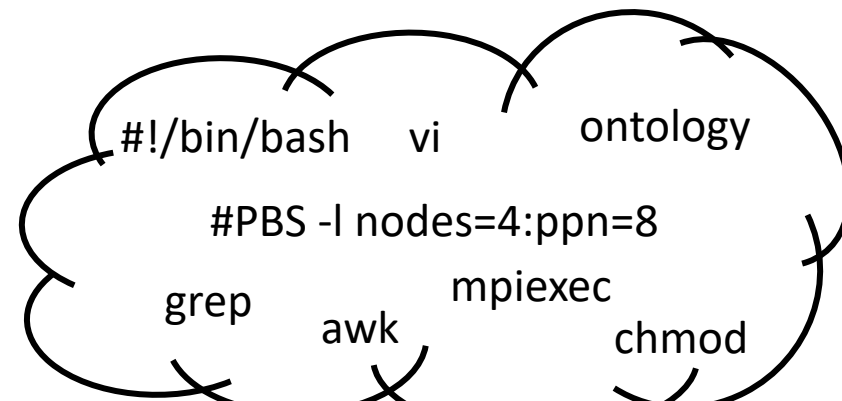
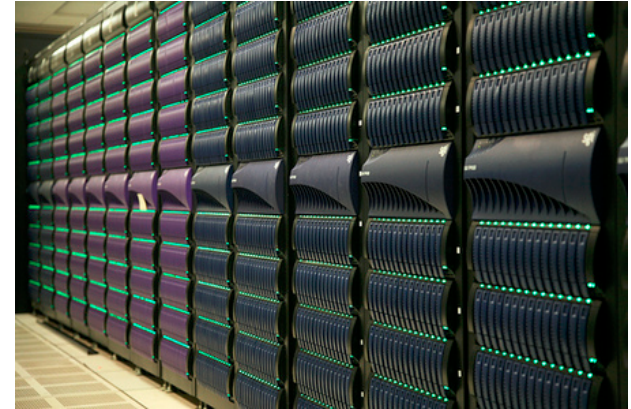
A Digital Divide

Researchers

- Experimentalists
- Modelers



Big Data and HPC

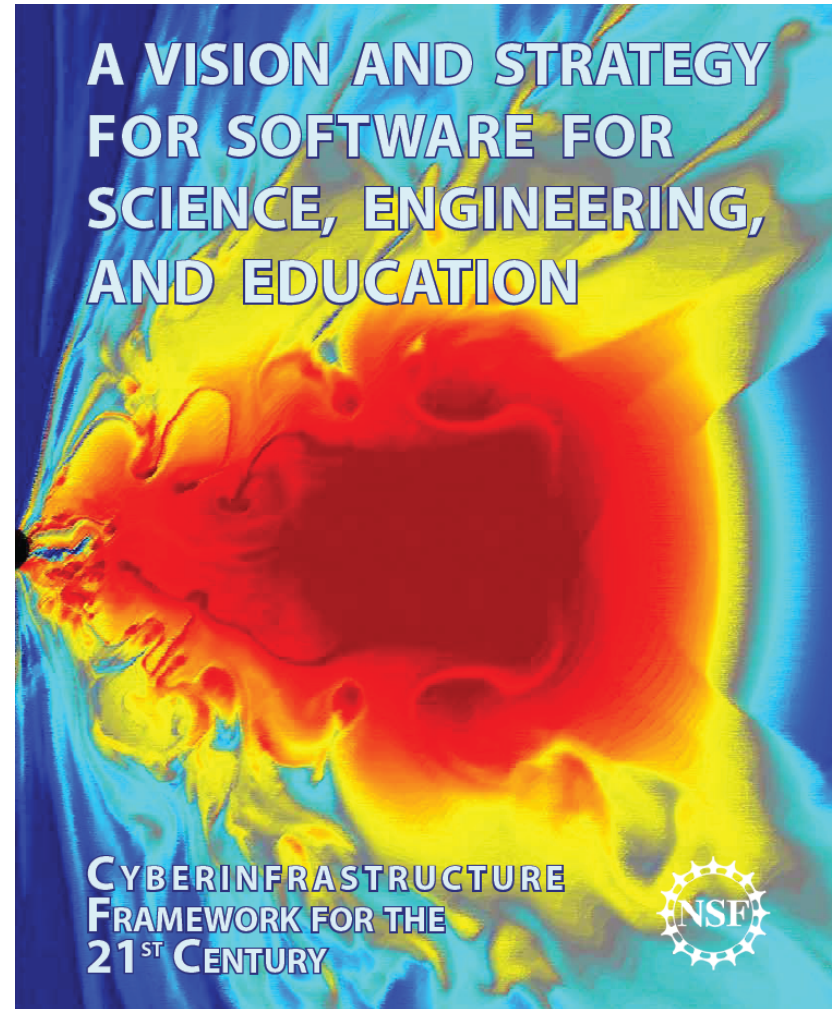


```
-bash-3.2$ ls tddata
logan      LoganOutlet.sbn  LoganOutlet.shp  LoganOutlet.shx
LoganOutlet.dbf  LoganOutlet.sbx  LoganOutlet.shp.xml
-bash-3.2$ ls tddata/logan
logan.tif
-bash-3.2$ ls
eric  logMpfel  run.bash  taudem.bash  taudem_submit.sh
logMpfel  run_all.bash  run_taudem.sh  taudem_041959  tddata
-bash-3.2$ run_taudem.sh pitremove -z logan -fel loganfel
43058.1b-net
-bash-3.2$
```

NSF vision

“enabling software systems are needed to create an environment in which the barrier to access is low for innovation and new discovery”

- Data Management and Preservation
- Software Sustainability



Overlying Concepts

- HydroShare must change the way we do science
- HydroShare is a collaboration environment and social media site
- HydroShare must appeal to the community
- HydroShare is designed and governed to be responsive to community input
- ***HydroShare has to be dead simple to use***

Functionality to be developed

1. A new, **web-based system** for advancing model and data sharing
2. **Sharing** features to HydroDesktop
3. Access **more types of hydrologic data** using **standards** compliant data formats and interfaces
4. Enhance **catalog** functionality that broadens **discovery** functionality to **different data types and models**
5. New **model** sharing and discovery functionality
6. Facilitate and ease access to use of **high performance computing**
7. New social media and collaboration functionality

Extend HIS Data Formats

- Point Observations (Time Series in ODM/WaterML)
- Feature data set (Shapefile of points, lines or polygons and attribute tables)
- Raster data set (GeoTIFF file)
- Multidimensional space/time data set (NetCDF file)
- Geochemistry (ODM2)
- Generalize catalog to include these formats
- Adopt or develop appropriate web services or data delivery mechanisms



HydroShare

Share your work with others

[Sign In](#) | [Settings](#) | [Notifications](#) | [Feedback](#) | [Help](#)

Dashboard

Recent Activity

My Content

View Your Resources

Explore

Discover Resources

Collaborate

Share with colleagues

Share and Collaborate

HydroShare is an online collaboration environment for sharing data, models, and code. Join the community to start sharing.



[HydroShare Gallery](#)

[How HydroShare Works](#)

[Getting Started](#)

[Getting Started](#)

[What's New](#)

[Provide feedback](#)

[HydroShare Blog](#)

[Developers](#)

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[CUAHSI](#)

[CUAHSI HIS](#)

[CUAHSI Water Data Center](#)

HydroShare

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Any opinions, findings, conclusions, or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the NSF.



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Dashboard

Recent Activity

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Collaborate


Share with colleagues

Recent Activity

All activity | [Only my activity](#)

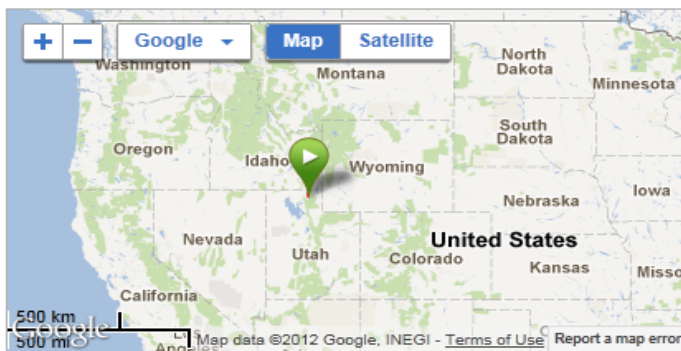
 Little Bear River ODM Database 6/6/2012

 Little Bear River Sites 6/6/2012

 Little Bear River Excel File 6/6/2012

 Watershed delineation Workflow 6/6/2012

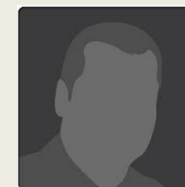
[More](#)



Abstract: Time series of water quality sensor data in the Little Bear River, Utah, USA

Keywords: Temperature, Dissolved Oxygen, pH, Specific Conductance, Turbidity

[View Details](#)



[Profile](#)

Jeff Horsburgh
Utah State University
jeff.horsburgh@usu.edu

Resources You May Like



[Little Bear River SWAT Model](#)
Shared by: [David Tarboton](#)



[Little Bear River DEM](#)
Shared by: [David Tarboton](#)

Announcements

What's New at HydroShare: Click [here](#) to visit the HydroShare blog to learn more about recent updates and new HydroShare features.

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Keyword:

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	Type ▲	Title ▲	Date ▲	Abstract▲
<input type="checkbox"/>		Little Bear River ODM Database	6/6/2012	Utah State University is conducting continuous monitoring within the Little Bear River watershed of northern Utah, USA to investigate the use of surrogate ...
<input type="checkbox"/>		Little Bear River Sites	6/6/2012	Shapefile of monitoirng sites in the Little Bear River watershed.
<input type="checkbox"/>		Watershed Delineation Workflow	6/6/2012	TauDEM workflow to delineate watershed from DEM. Stream threshold is determined automatically to obtain objective drainage density estimate.
<input type="checkbox"/>		Little Bear River SWAT Model	6/6/2012	This is a Soil and Water Assessment Tool model package that is ready to execute. All inputs and outputs are included in the model package.
<input type="checkbox"/>		Little Bear River DEM	6/6/2012	2 m resolution Digital Eleava6tion Model derived from LIDAR.
<input type="checkbox"/>		Stream Metabolism R Script	6/6/2012	This R script contains a set of functions that implement a one-station stream metabolism model
<input type="checkbox"/>				

Results 1 – 10 of 100 << 1 2 3 4 5 6 7 8 9 10 >>

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Explore

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Collaborate

Share with colleagues

Little Bear River SWAT Model | Resource Details

Open

Execute

Share

Export

Edit

Delete



Resource Type: Model Package

Created by: Jeff Horsburgh

Created: 6/10/2012

Keywords: Little Bear River, Nutrients, Phosphorus, Water Quality, Model

Size: 100 MB

★★★★★ (76)

Resource Description

Abstract: This is a Soil and Water Assessment Tool model package that is ready to execute. All inputs and outputs are included in the model package.

Required Inputs: High frequency (sub-daily) measurements of water temperature, dissolved oxygen, solar radiation, barometric pressure,

Outputs: Daily estimates of streamflow and water quality for subwatersheds in the Little Bear River.

Citation: Horsburgh, J. S. (2012), Little Bear River SWAT Model, Utah State University, Logan, UT.

Comments

[Add Comment](#)



Jeff Horsburgh: This model package is ready to execute.

Shared With



Jon Goodall
University of South Carolina

Similar Resources



[Neuse River SWAT Model](#)

Shared by: **[Jon Goodall](#)**



[Neuse River Rhessys Model](#)

Shared by: **[Larry Band](#)**

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Any opinions, findings, conclusions, or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the NSF.

E.g. SWATShare

- A HUBZero based tool for publishing, sharing, and accessing Soil Water Assessment Tool (SWAT)

The screenshot shows the SWATShare web interface. At the top, there is a navigation bar with links: Home, my HUB, Resources, Members, Explore, About, and a Need Help button. Below this, a light blue banner indicates the user is in the SWAT Share section. The main content area has a tabbed interface with View, Upload, Edit, Run, and Visualization. The View tab is active, displaying a map of the United States with a red watershed boundary. A zoom control is visible on the left. A table with properties and values is overlaid on the map. To the right, a sidebar titled 'My Models' lists several models: cedar, demo, testcase, and testcase2.

Property	Value
User ID	mvittori
Model Name	term_project
Version	SWAT2009
HUC ID	05120205
Country	
State	
Dem resolution	30

My Models

- cedar
- demo
- testcase
- testcase2

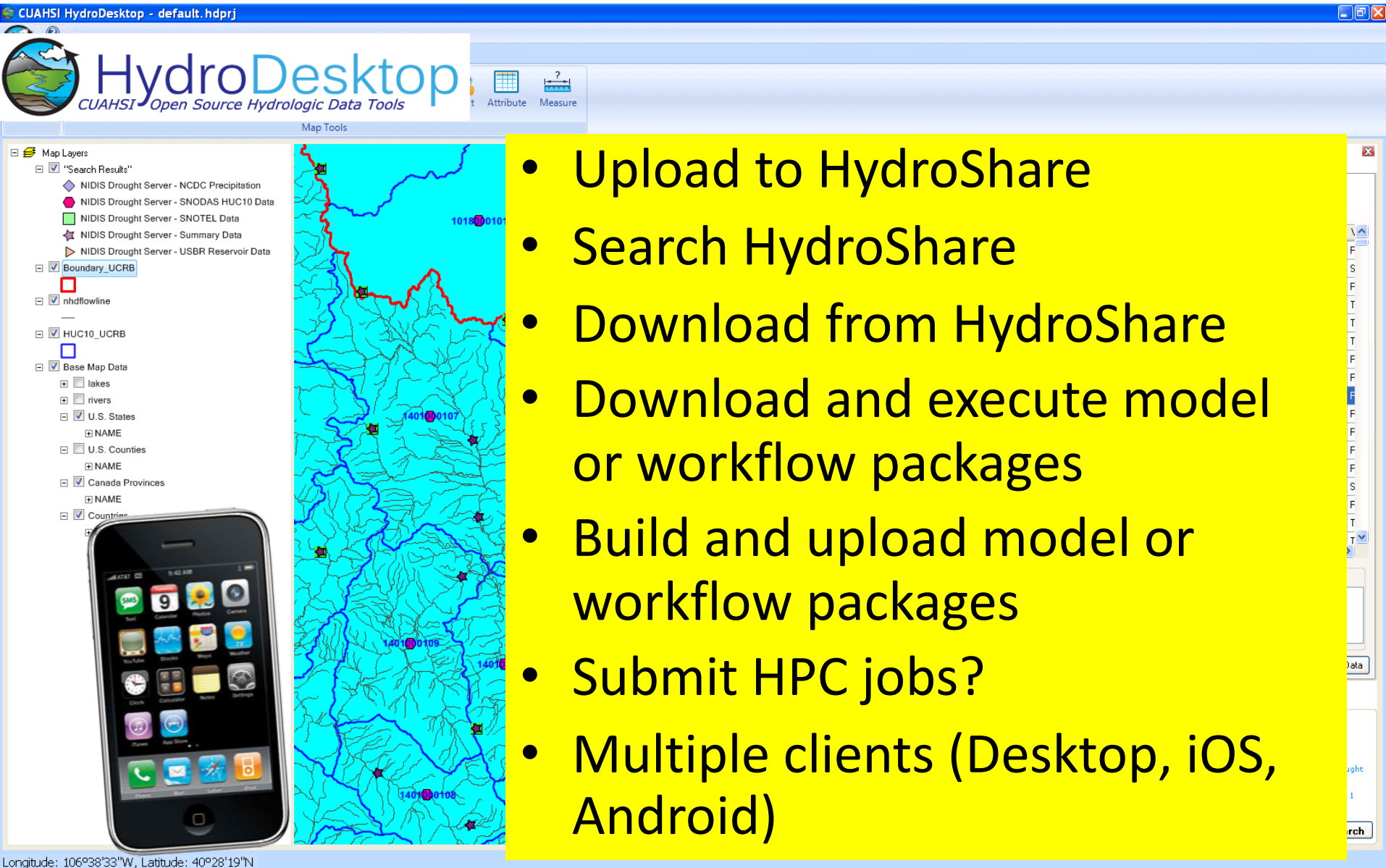
Interoperable data sharing

- Tim Berners-Lee contends that the danger of social networking sites is that most are silos and do not allow users to port data from one site to another. He also cautions against social networks that grow too big and become a monopoly as this tends to limit innovation.

<http://www.scientificamerican.com/article.cfm?id=long-live-the-web>

- ***We need:***
 - ***Well defined APIs for client application developers***
 - ***Well defined data encoding and transfer formats to ensure that all data is portable***
 - ***Standard CRUD interfaces***

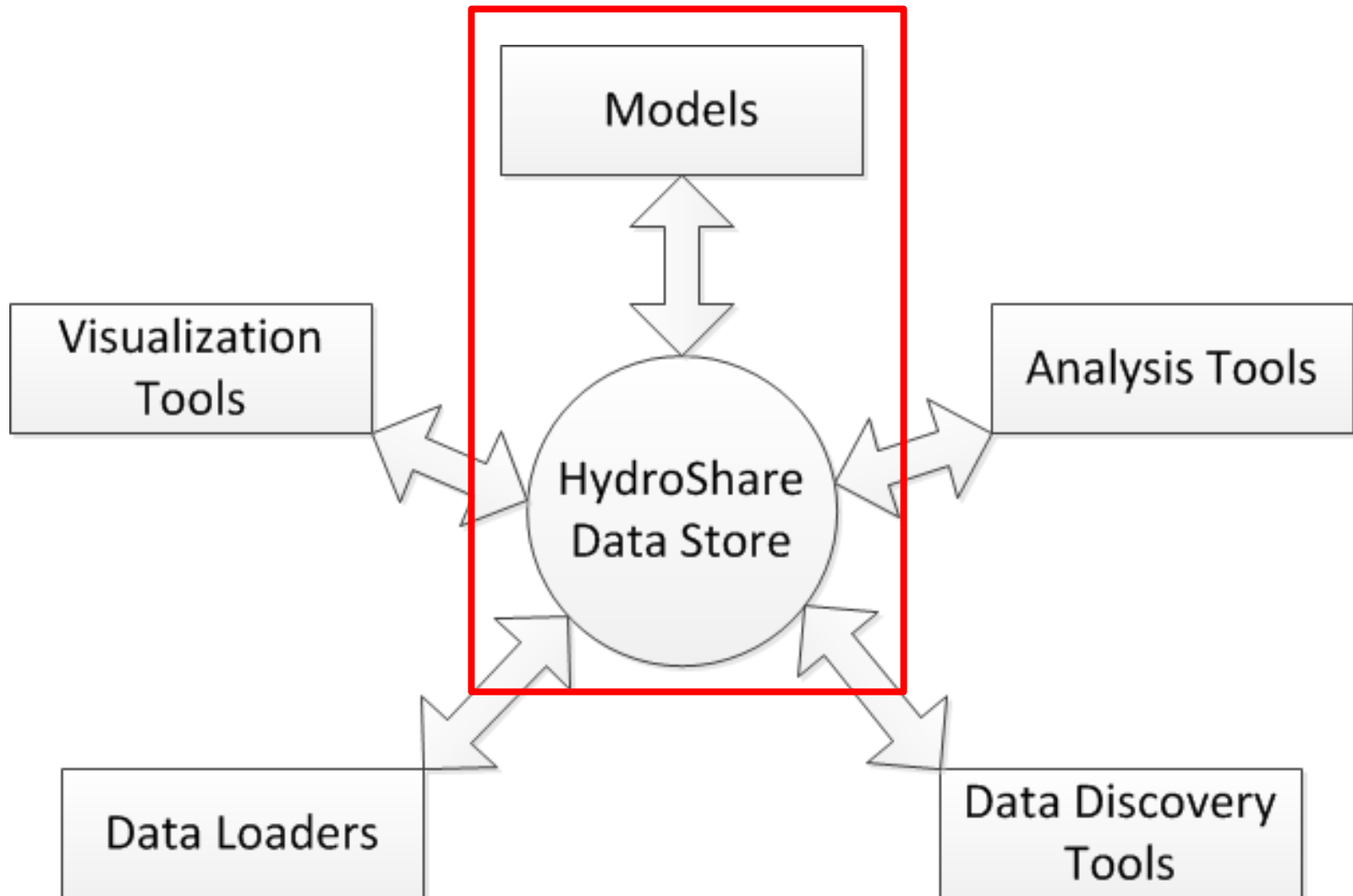
Support Client/App Functionality



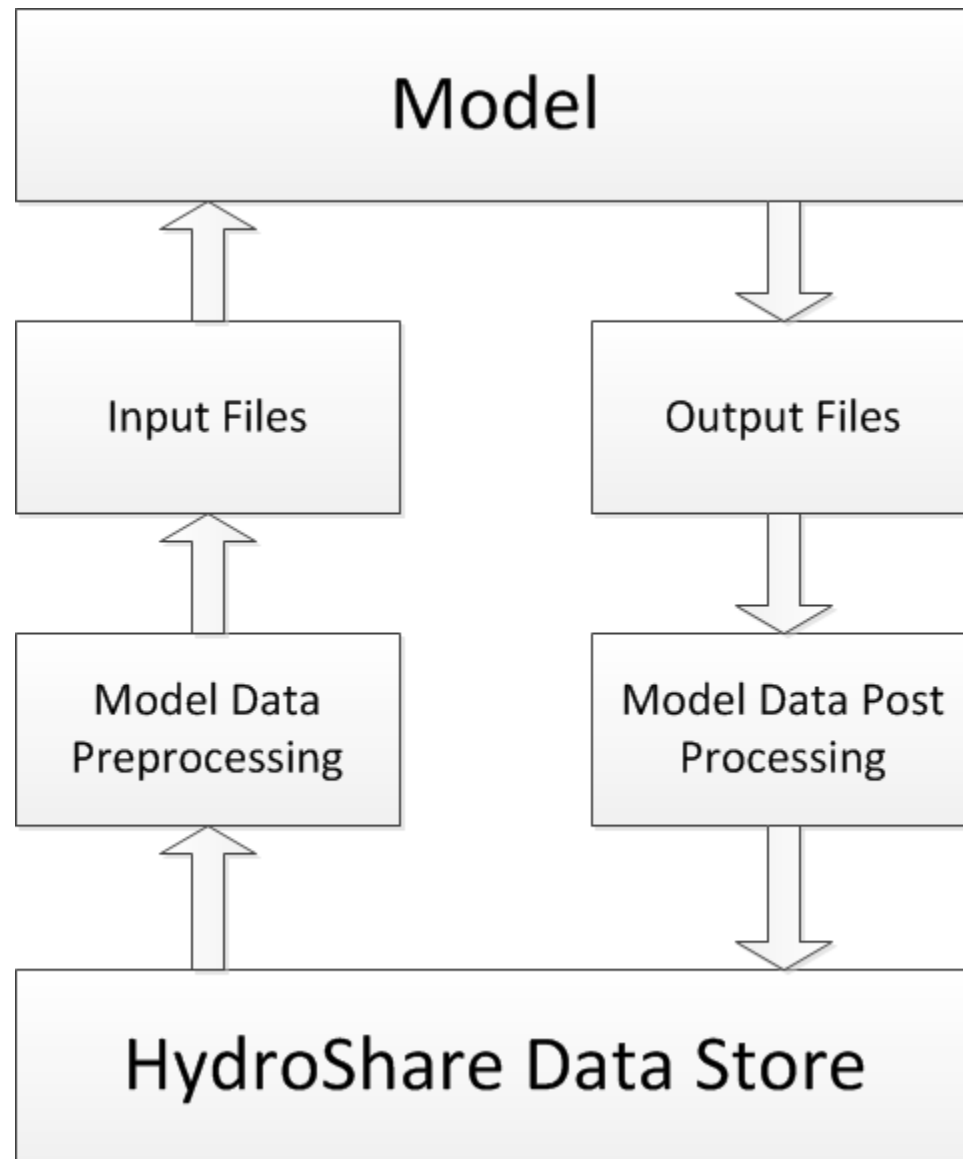
The screenshot shows the HydroDesktop application window. The title bar reads "CUAHSI HydroDesktop - default.hdrpj". The interface includes a "Map Tools" toolbar with icons for "Attribute" and "Measure". On the left, a "Map Layers" panel lists several layers: "Search Results" (including NIDIS Drought Server data), "Boundary_UCRB", "nhdflowline", "HUC10_UCRB", and "Base Map Data" (including lakes, rivers, U.S. States, U.S. Counties, Canada Provinces, and Countries). The main map area displays a watershed with blue lines for rivers and a red boundary. A yellow box on the right contains a list of functionalities. In the bottom left corner, there is an image of an iPhone displaying the HydroDesktop app interface. At the very bottom, the coordinates "Longitude: 106°38'33\"W, Latitude: 40°28'19\"N" are displayed.

- Upload to HydroShare
- Search HydroShare
- Download from HydroShare
- Download and execute model or workflow packages
- Build and upload model or workflow packages
- Submit HPC jobs?
- Multiple clients (Desktop, iOS, Android)

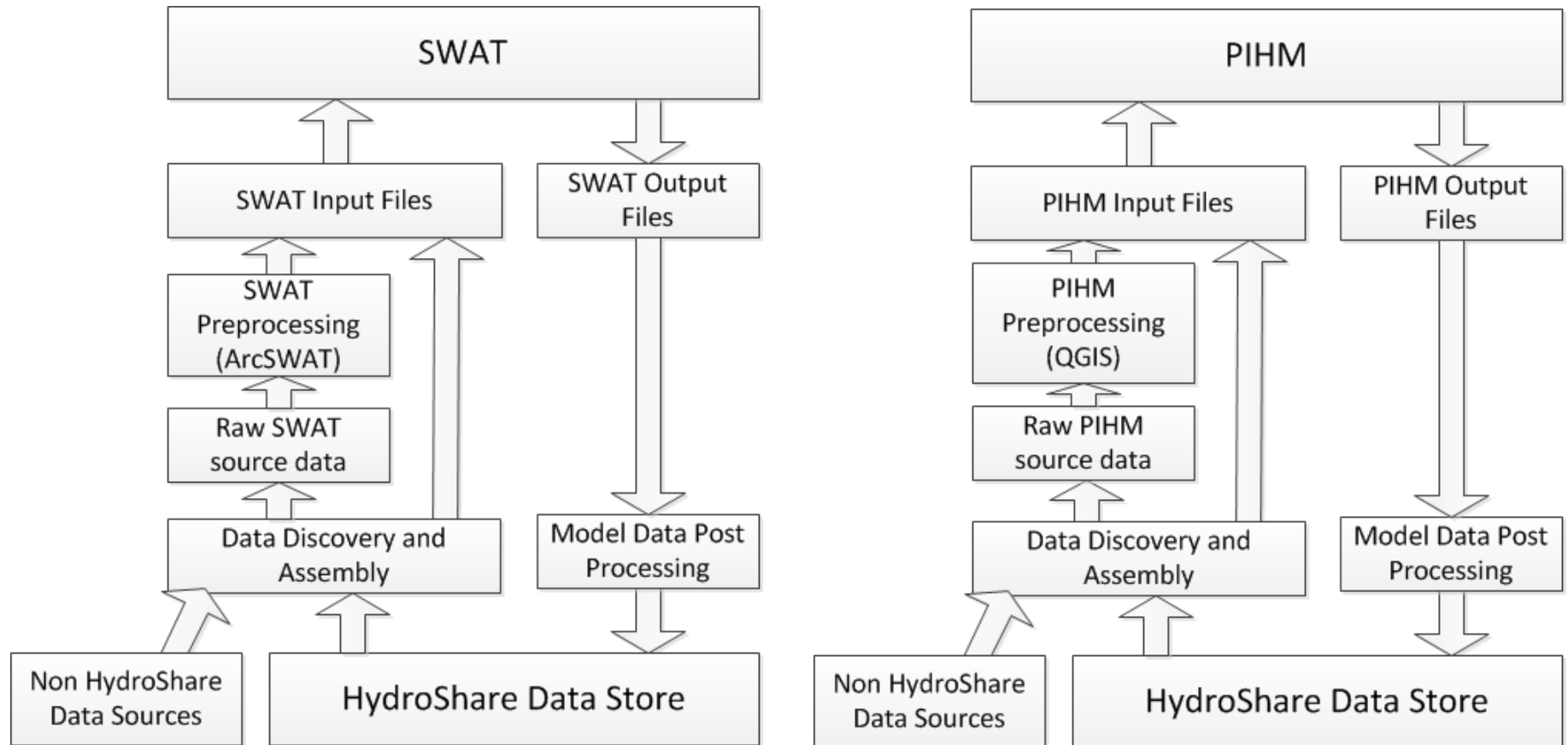
Using HydroShare for Modeling and Analysis



General Model Execution Paradigm



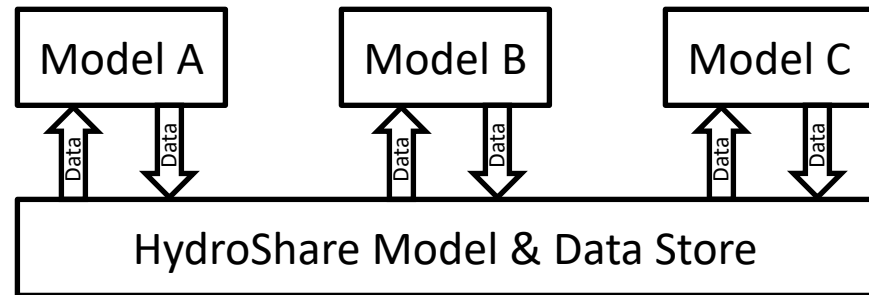
Examples



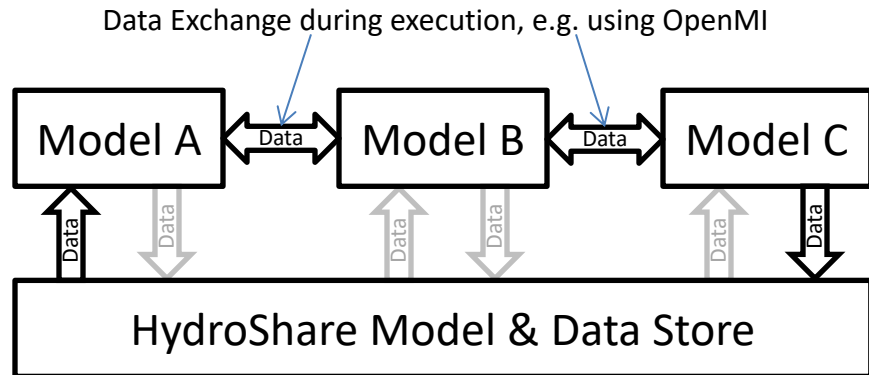
VIC, HSPF, Others ... You contribute your model

Levels of Model Integration

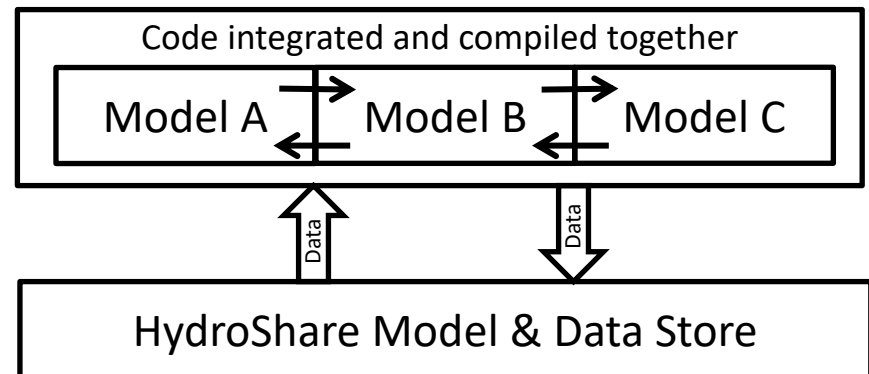
Data centric workflow



Loose coupling

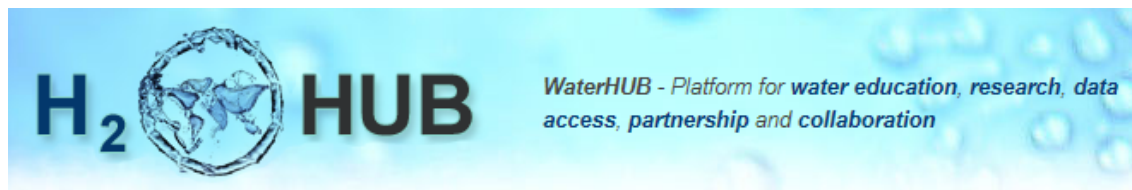


Tight coupling





HUBzero Based Community Portal

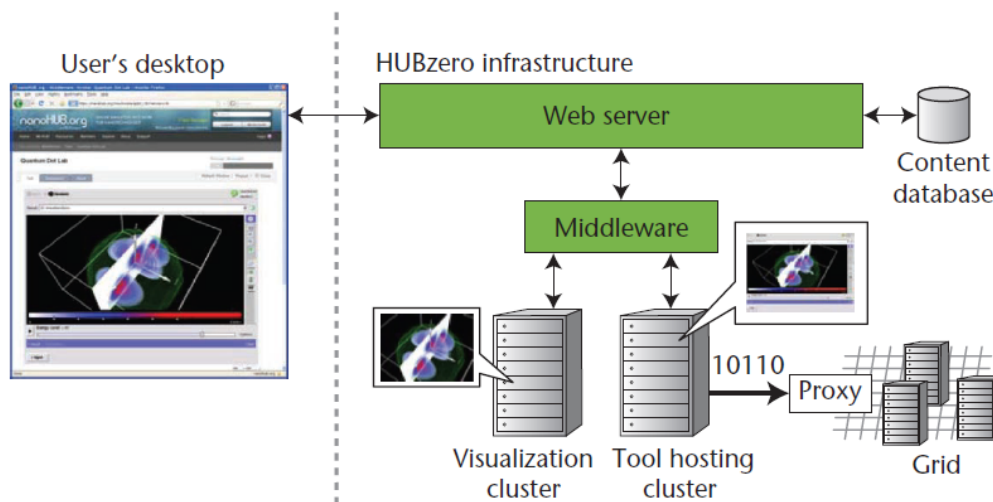


Data & Model Resources

- Discovery & access
- Development
- Execution on local VM
- Execution on remote HPC
- Publishing
- Collaboration

Web Portal

- Social networking
- Community collaboration
- Resource rating
- Documents & videos
- Learning modules



Architecture of HUBzero platform used to create dynamic web sites for scientific research and educational activities

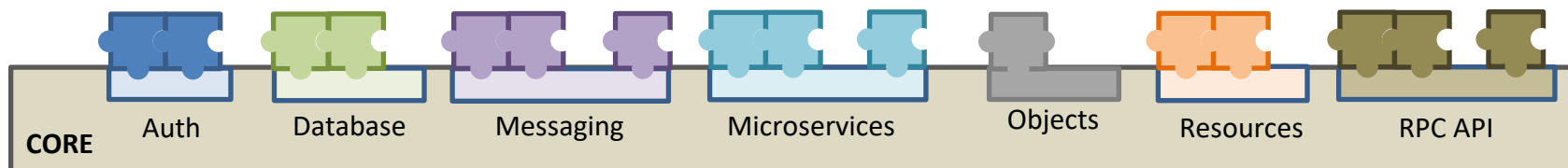
<http://dx.doi.org/10.1109/MCSE.2010.41>

<http://hubzero.org>

<http://water-hub.org>

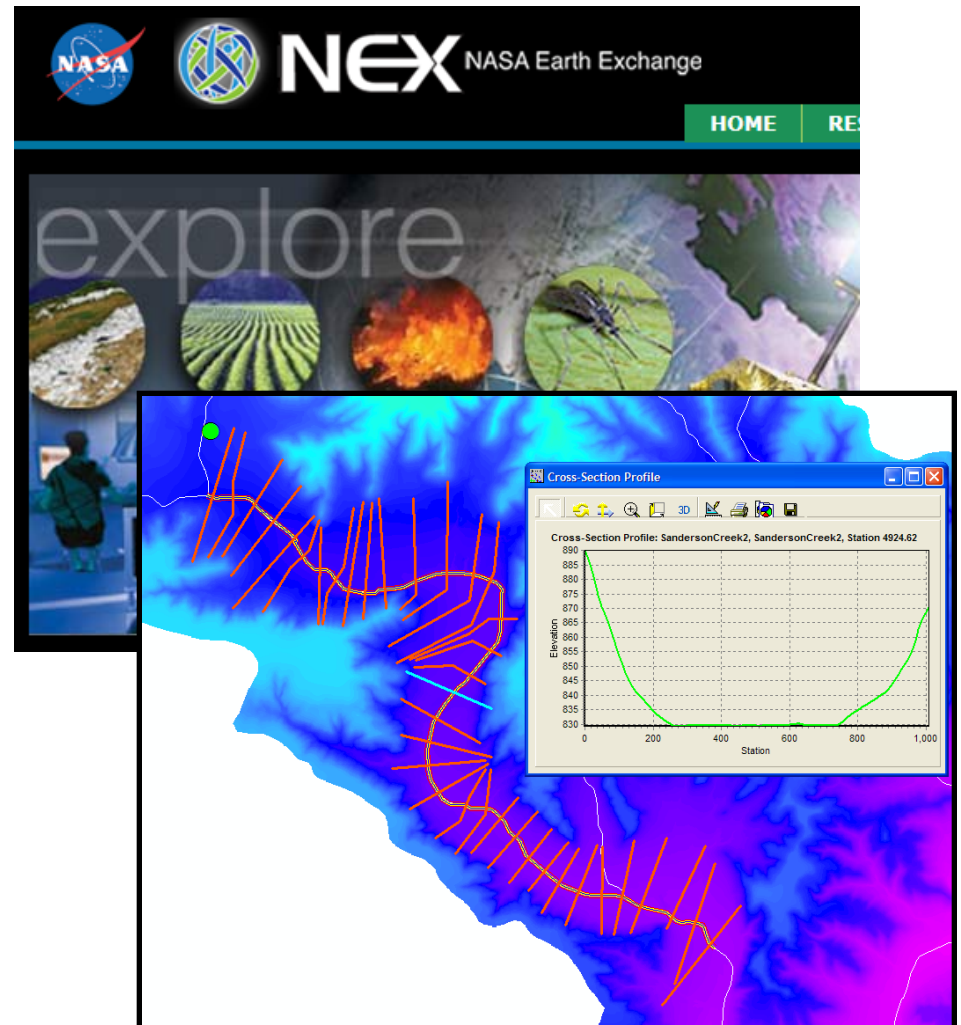
Enterprise Integrated Rule-Oriented Data System

- Open source middleware with pluggable architecture produced by UNC Chapel Hill (i.e. production quality iRODS)
- Via microservices:
 - iRODS rules can automatically register available data
 - Programmatic capability to process data on upload/registration
 - Can automatically convert file formats (e.g. to create resources for visualization)
 - Can automatically assign unique and persistent identifiers
 - Can automatically parse metadata for semantic content and tag with additional semantic content
 - Can make metadata discoverable by other users/tools
- Access control is enforced at the file level
- Rules can be scheduled and run periodically



Facilitating Access to Critical National Datasets

- NASA Earth Exchange
- National **River Morphology** Dataset
- Baltimore and Coweeta LTER
- Already part of HIS
 - USGS Streamflow
 - EPA
 - Others





HydroShare

Share your work with others

Share

Your Resources

Explore

Discover Resources

Collaborate

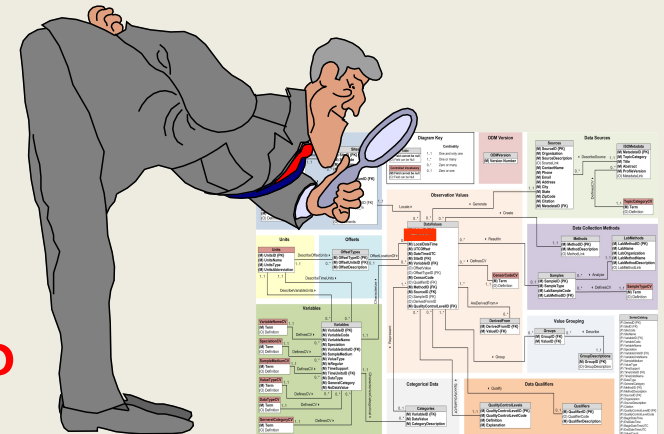
Interact with colleagues

Summary

- Simple and easy to use
- Data and model sharing enabled by open standards based metadata
- Find, create, share, connect, interact, work together online
- Archive data collections accompanying research publications in easily accessible way
- Integration and synthesis across data collections

To participate

- See <http://his.cuahsi.org>
- Join his@sdsc.edu
- Write dtarb@usu.edu



Questions ?

HydroShare

